U. S. FOREST SERVICE

RESEARCH NOTE NC-106

NORTH CENTRAL FOREST EXPERIMENT STATION, FOREST SERVICE—U.S. DEPARTMENT OF AGRICULTURE

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ASPEN SUCCESSFULLY REGENERATED AFTER KILLING RESIDUAL VEGETATION WITH HERBICIDES

ABSTRACT. — Overstories left after aspen-mixed hardwood stands are logged can be controlled with aerially applied herbicides without endangering aspen suckers.

OXFORD: 231.5:414.13:176.1 *Populus tremuloides*

Dense suckering usually follows clearcutting of aspen (*Populus tremuloides* Michx.) if little or no residual vegetation is left. But in mixed stands where a thick overstory of unmerchantable species is left, aspen sucker regeneration cannot develop satisfactorily due to competition.[1] To insure a heavy stocking of aspen suckers on these areas the residual overstory must be eliminated. Individual trees may be felled, girdled, or poisoned on areas with few residuals, but this will be too expensive in most areas. Mechanical methods such as bulldozing and shearing are common in the Lake States. Prescribed burning can be effective if adequate fuel and suitable weather conditions prevail. Another promising method of controlling residual vegetation is aerial spraying with herbicides.

THE STUDY

North Central Forest Experiment Station researchers, in cooperation with the Chippewa National Forest staff, evaluated several areas where aspen had been commercially clearcut. Three areas, ranging in size from 41 to 110 acres, were selected for treatment. One area was logged in May 1966, and the other two in June and July 1967, respectively. Site index was medium to good but the stands produced only 7 to 16 cords of aspen per acre when cut at age 40 because of partial stocking and other hardwood species mixed with the aspen. The remaining hardwoods, while not of sufficient value or density to produce a desirable stand, would have prevented the successful establishment of a new stand of aspen. Various quantities of paper birch (*Betula papyrifera* Marsh.), sugar maple (*Acer saccharum* Marsh.), red maple (*Acer rubrum* L.), red oak (*Quercus rubra* L.), basswood (*Tilia americana* L.) and other hardwoods and conifers were present. The terrain was gently rolling and the soils were well-drained loamy sands.

To kill the remaining overstory vegetation and provide suitable conditions for aspen regeneration, 2,4-D and 2,4,5-T were applied by helicopter in early August 1967.[2] The herbicides greatly reduced the overstories, particularly paper birch and red oak. On the areas logged in 1967, aerial portions of the suckers were completely

[1] *J. H. Stoeckeler and J. W. Macon. Regeneration of aspen cutover areas in northern Wisconsin. J. Forest. 54: 13-16. 1956.*

[2] *3-lb. acid equivalent (ae) 2,4-D (2,4-dichlorophenoxyacetic acid) per acre was used except on areas with high proportions of maples or oaks, where 2 lb. ae 2,4,5-T (2,4,5-trichlorophenoxyacetic acid) plus 1 lb. of 2,4-D was used. All herbicides were isooctyl esters applied in water emulsion at 4 gal. per acre.*

killed, but new suckers developed the following year. In contrast, on the area logged in 1966, tops of the suckers were only partially killed, causing crooked stems or multiple leaders to develop the following growing season (fig. 1). This is not expected to cause later problems, however, because one of the leaders will assume dominance and the deformities should correct naturally. In another study, aspen suckers that had been sprayed at age 5 and only partially killed had no multiple leaders 5 years later and crook was unnoticeable in most trees.

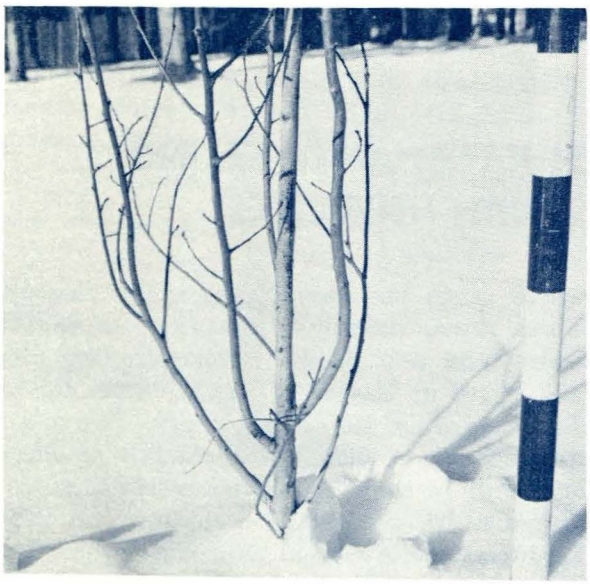

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Figure 1.—A 3-year-old aspen sucker partially killed by spraying 2,4-D at age two. The top three-fourths of the original stem is dead and several leaders have developed, one of which will attain dominance. Scale divisions are 4 inches.

No evidence of herbicide damage to aspen roots was noted for either the 1- to 2-year-old suckers.[3] The number of aspen suckers on the three study areas 1 year after spraying ranged from 6,700 to 14,500 per acre (table 1).

Table 1.—Aspen sucker stocking of three stands commercially clearcut and sprayed with 2,4-D alone or in mixture with 2,4,5-T on August 11, 1967

Date of logging	Overstory basal area: After cutting	Overstory basal area: After spraying	Aspen suckers: Number per acre	Aspen suckers: Percent stocking
	----Sq. ft./acre----			
May 1966	46	18	6,700	80
June 1967	29	18	14,500	100
July 1967	34	2	9,700	65

[3] *In other studies herbicides containing picloram (4-amino-3,5,6-trichloropicolinic acid) were more effective against the species studied here, but also completely killed aspen (including roots) at a rate of 1 lb. per acre picloram.*

DONALD A. PERALA
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PESTICIDE PRECAUTIONARY STATEMENT

This publication reports research involving pesticides. It does not contain recommendations for their use, nor does it imply that the uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and/or Federal agencies before they can be recommended.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife – if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.